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Grim up North or Northern Grit? Recessions and the English spatial health divide (1991 – 2010)

Alison Copeland ^{1,2}, Adetayo Kasim ², Clare Bamba ^{1,2}

1 Department of Geography, Durham University, UK.

2 Wolfson Research Institute for Health and Wellbeing, Durham University, UK

Corresponding author: Clare Bamba, Department of Geography and Wolfson Research Institute, Durham University Queens Campus, Stockton on Tees, TS17 6BH clare.bamba@durham.ac.uk

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Abstract

Background: Previous research suggests that the health effects of recessions are mixed and vary spatially *between* countries. Using the North-South English health divide as an example, this paper examines whether there are also spatial variations *within* countries.

Methods: Cross-sectional data on self-reported 'not good health' was obtained from the British Household Panel Survey (BHPS) and the Health Survey for England (HSE) from 1991 to 2010. Age-adjusted generalised linear models were used to examine the effects of recessions (1990/91 and 2008/9) on self-reported health in the four English NHS Commissioning Regions (North, South, Midlands and London) with stratification by gender.

Results: Over the 20 year study period, the North had consistently higher rates of 'not good health' than the South (OR 1.50 [1.46 to 1.55] outside recessions and OR 1.29 [1.19 to 1.39] during recessions). However, during periods of recession, this health divide narrowed slightly with a 2% decrease in the prevalence of 'not good health' in the North (OR 0.91 [0.86, 0.96]).

Conclusion: This study is evidence of spatial variations in the health effects of recessions *within* England and the North-South divide appears to slightly reduce during recessions. Health in the North remains worse than the South.

Keywords: Health inequality, social determinants, public policy, unemployment

Abstract word count: 194

Grim up North or Northern Grit? Recessions and spatial inequalities in self-reported health in England (1991 – 2010)

Background

The epidemiological literature suggests that the public health effects of recessions are rather mixed and can also vary spatially *between* countries. Using the longstanding North-South health divide in England as an example, this paper is the first to examine whether there are also spatial variations *within* countries in the health effects of recessions.

The North-South divide

The North-South divide is a powerful trope within popular English culture (Morley, 2013) and it is also evident within the country's health. A recent report by Public Health England (2013) showed that between 2009 and 2011 people in Manchester were more than twice as likely to die early (455 deaths per 100,000) compared to people living in Wokingham (200 deaths per 100,000). This sort of finding is not new; for the past four decades, the North of England has persistently had higher all-cause mortality rates than the South of England and the gap has widened over time (Hacking, et al., 2011). People in the North are consistently found to be less healthy than those in the South across all social classes and amongst men and women (Dorling, 2010; Marmot Review, 2010; Stafford and Marmot, 2003; Doran and Whitehead, 2004; Hacking et al., 2011). For example, average male life expectancy in 2008-10 in the North West of England was 77 years compared to 79.7 years in the South East (Office for National Statistics, 2011). Whitehead and Doran (2011) suggest that this geographical health divide in England can be explained by social and economic differences with the North being more deprived than the South. Recent figures from the Office of National Statistics (ONS) support this argument, showing that over the past 20 years the North has consistently had lower employment rates than the South for both men and women (ONS, 2012). For example, Labour Force Survey data shows that even before the 2008/9 recession, the employment rates in the North

East of England were 70.5% compared to 79.4% in the South East (Jenkins and Leaker, 2010). This is associated with the lasting effects of de-industrialisation (Erdem and Glyn, 2001) as in the latter part of the 20th century, there were regionally concentrated falls in the demand for labour (most notably in the North East and North West), particularly affecting those with less education (Nickell and Quintini, 2002). This has resulted in significant regional variation in the wealth and economies of the regions with some more manufacturing- or services-based, or with more or less public sector involvement (see Box 1). The English regions also vary in terms of their pre-recession baseline employment rates, as well as experiencing different rates of recession-related increases in unemployment (Jenkins and Leaker, 2010). These regional differences have led to large spatial variations in employment rates – and in health – (Nickell and Quintini, 2002) which may be further exacerbated by the recent economic recession.

Recessions and health

Recessions are characterised by instability (in terms of employment, inflation and interest rates) and sudden reductions in production and consumption with corresponding increases in unemployment. The epidemiological literature suggests though that the population health effects of recessions are rather mixed (Bambra, 2011) with the majority of international studies concluding that all-cause mortality, deaths from cardiovascular disease and from motor vehicle accidents and hazardous health behaviours *decrease* during economic downturns, whilst deaths from suicides, rates of mental ill health, self-reported general health and chronic illnesses *increase* in some – but not all countries (Stuckler and Basu, 2013). Key social risk factors such as unemployment – which is associated with increased rates of ill health, mortality and adverse health behaviours (Bambra, 2011) – or job insecurity also increase during recessions. Previous research has suggested some notable gender differences in the effects of recessions on health. For example, (Katikireddi et al., 2012) recent study of England found that the mental health of men – but not women – deteriorated during the 2008/9 recession. Similarly, (Gerdtham and Johannesson, 2005) found all-cause mortality

increased significantly during periods of recession for Swedish men but not Swedish women. Studies have also suggested that the health effects of recessions can vary spatially *between* countries as a result of different policy responses (Stuckler and Basu, 2013). However, to date there has been an absence of studies examining variation within countries in the health effects of recessions. Using the longstanding North-South health divide in England as an example, this paper is the first to examine whether there are also spatial variations *within* countries in the health effects of recessions.

Methods

Data and variables

In order to cover two English recessions (1990/91 and 2008/09), this study uses data from the British Household Panel Survey (BHPS – cohort survey) 1991 to 1993 and the Health Survey for England (HSE – a repeat cross-sectional survey) 1994 to 2010. Although the HSE began in 1991, no geographic identifiers were available for the early part of the survey (1991 to 1993) so these years were substituted with data from the BHPS. The HSE is an annual repeat cross sectional survey of individuals, whereas the BHPS is an annual cohort study. Therefore stratified random sampling was used on the BHPS data to split the samples into separate individuals for each year of data used. Children under the age of 16 were excluded from the study, along with full-time students. This gave a total sample of 190,098 ranging from 3781 to 15052 per year. The BHPS and the HSE have average response rates of 74%.

Recessions are globally defined as two successive quarters of negative growth in Gross Domestic Product (GDP) (Oxford Dictionaries, 2012). GDP was therefore chosen to represent the economic climate at the country level and this was obtained for the UK from the Organisation for Economic Co-operation and Development (OECD: Organisation for Economic Co-operation and Development, 2012). Each year of data for the HSE was categorised into whether there was a recession or not that

year according to whether there had been two successive quarters of negative growth that year. The UK (including England) had two distinct periods of recession; 1990 to 1991 and 2008 to 2009.

Using the Local Authority identifier, each respondent was assigned to one of the four 'new' National Health Service (NHS) Commissioning Regions: North of England (the 'old' Government Office and Strategic Health Authority regions of North East, North West and Yorkshire and Humber); Midlands and East (the 'old' East Midlands, West Midlands and East of England regions); London; and South of England (the 'old' South East and South West) (ONS Geography, 2010). Until 2013, the nine regions all had Government Offices which were administratively and economically important in terms of having some devolved responsibility for the local economy including the allocation of regional development funds, drawing up regional economic strategies, and encouraging inward regional investment (including the receipt of European Union funding). Regional public health groups and Strategic Health Authorities also existed at a regional level and some public health interventions were regionally operated and coordinated. The four 'new' regions (and the nine 'old' sub-regions upon which they are based) are described in Box 1.

Self-reported general health status was chosen as the outcome variable. Respondents were asked to rate their general health as 'excellent', 'good', 'fair', 'poor' or 'very poor'. This was then dichotomised into two responses; 'not good health' (fair, bad or very bad health), or 'good health' (good or excellent health).

Analysis

Age adjusted prevalence rates of 'not good health' were produced by region and year and graphed for the North and South regions over the percentage change in GDP for 1991 to 2010. An initial model was used to check that any changes over time were not due to a secular trend (see web appendix 1). Age-adjusted generalised linear models were then used to investigate the effect of

recessions on self-reported health in the four different NHS Commissioning Regions with a particular focus on the health divide between North and South. Given the findings of previous research (e.g. Katikireddi et al, 2012), the analysis was also stratified to see if there were any variations by gender. The actual models can be seen in web appendix 2.

Results

Figure 1 plots the prevalence of age-adjusted prevalence of 'not good health' (with 95% CI) with the percentage change in GDP for the North and the South regions for the 20 year study period (1991 to 2010). It shows that the North had consistently higher rates of 'not good health' compared to the South. During both periods of recession (1990/91 and 2008/9) though, the health divide in the prevalence of 'not good health' narrowed between the North and the South.

Table 1 compares the age-adjusted prevalence, the rate differences and the odds ratios (with 95% CI) of 'not good health' between recession and non-recession for each of the four NHS commissioning regions for the total population and stratified by gender. This shows that in the South and in London, the percentage of people reporting 'not good health' increased by 1.2% and 1.6% respectively during the recessions, however these were not significant increases. In contrast, in the North of England and in the Midlands regions, the percentage of people reporting 'not good health' decreased significantly in recessions by 2% (OR 0.91 [0.86, 0.96]) and 1.4% (0.92 [0.87, 0.98]) respectively. There were no significant differences in these patterns by gender.

Table 1 also shows the odds ratio (with 95% CI) of 'not good health' for each region in both recessions and non-recessions compared to the South. This shows that the odds of reporting 'not good health' were 50% higher (OR 1.50, 1.46 to 1.55) in the North than the South outside recession and continued to be 29% higher (OR 1.29, 1.19 to 1.39) during recession. Self-reported 'not good health' also remained significantly higher than the South in London during recessions (OR 1.25 [1.12,

1.40]) although the gap between the South and the Midlands decreased substantially from 23% to 7% (OR 1.23 [1.19, 1.27] to 1.07 [0.99, 1.17]) and was no longer statistically significant. The results also show that the odds of reporting 'not-good health' for men was 55% (OR 1.55, 1.48 to 1.63) higher in the North than the South outside recession and continued to be 25% (OR 1.25, 1.11 to 1.41) higher during recession. Similarly, the odds of 'not good health' for women was 46% (OR 1.46, 1.41 to 1.53) higher in the North than the South outside recession and continued to be 31% (OR 1.31, 1.18 to 1.46) higher during recession.

Discussion

Main findings of this study

This paper has shown that there are spatial variations *within* England in the health effects of recessions with significant reductions in the prevalence of self-reported 'not good health' in the North of England and in the Midlands. It has also found that regional health inequalities, and the long-standing English health divide between North and South, reduce significantly during recessions. However, the study has also found that the North has consistently greater levels of poor health than the South even during recessions. No differences were found by gender.

What is known of this subject

Previous research has shown that the population health effects of recessions vary by health outcome (Bambra, 2011) with the majority of studies concluding that all-cause mortality, deaths from cardiovascular disease and from motor vehicle accidents and hazardous health behaviours *decrease* during economic downturns, whilst deaths from suicides, rates of mental ill health, self-reported general health and chronic illnesses *increase*. This paper has suggested that these increases in self-reported health may not be evenly geographically spread within a country with some regions experiencing declines in health whilst others experienced improvements. The latter is the most difficult to explain as it was the most deprived region – the North - that experienced a health

improvement during the recessions of 1990/1 and 2008/9. Speculating on the basis of insights from theories of health inequalities, it can be suggested that this may perhaps be as a result of: (1) artefact - in terms of regionally different responses to the self-reported health question; (2) health behaviours - the improvement in the North may be as a result of decreased smoking and alcohol consumption, something that international evidence suggests occurs amongst the heaviest users during a recession, (Ruhm and Black, 2002); (3) psychosocial - the North may be more 'resilient' when faced with economic uncertainty as a result of higher family-based social capital (Cairns-Nagi and Bambra, 2013), equally peoples assessment of health may be comparative, so they may assess their health as better when they perceive that the situation of those around them is deteriorating or if it is perceived that people are more unhealthy in the surrounding area they may perceive their own health to be more unhealthy than it is (C. Bambra and Popham, 2010; Sadana et al., n.d.); or (4) material - unemployment rose quicker in the South than the North in 2008/9, it may also be the case that the jobs that were lost in the North may have been 'less healthy' in the first place.. However, the findings of the study are challenging and show the complexities of assessing the health effects of macro-economic factors.

The health effects of recessions have also previously been shown to vary *between* countries (Stuckler and Basu, 2013), potentially as a result of different policy responses. A considerable body of work by Basu and Stuckler (2013) has demonstrated that health worsens (particularly in the case of suicides and mental health) in countries in which deficit reduction policies and austerity measures are implemented after a financial crisis. In contrast, countries that expand state investment and increase expenditure on welfare services in response to recessions fare better and do not experience a decline in population health. This paper has found that there are also variations in the health effects of recessions *within* countries, although the extent to which this can also be explained by policy variation is limited as whilst the English regions had a limited amount of devolved power until

2013 including some responsibility for public health and economic development, it is doubtful whether this would be sufficient to have a modifying impact on the effects of recessions.

What this study adds

This is the first study to examine whether the health effects of recessions using self-reported health status vary *within* countries and the first to examine the effects of recessions on the North-South health divide in England. The findings suggest that recessions do not have an even health impact *within* countries. This is in keeping with studies of international variations in the health effects of recessions *between* countries. However, in the regional case there is no ready explanation for why the recessions of the 1990/1 and 2008/9 led to a reduction in the North-South health divide. Further research that uses more objective health outcomes (such as mortality data), a cohort design and that is able to examine the longer term impacts of the most recent recession would be beneficial in this regard.

Study limitations

Care needs to be taken in interpreting these results. The data for England only begins in 1991, directly after a recession has taken place. This means there was only a single year of recession in the early part of the study. The HSE uses cross-sectional data for each year and so there are different respondents in each year. The main variable is self-reported health, a subjective measure that may be subject to cultural variation, social perceptions, socioeconomic status or employment status within a country. A further qualitative study could help to determine whether the health divide between North and South is influenced by these additional subjective measures but is beyond the scope of this initial study. However, previous studies have found a strong relationship between self-reported health and mortality (Idler and Benyamini, 1997), which does not vary by socioeconomic status (Burström and Fredlund, 2001). The study period ends in 2010 and so does not have data for the 'double-dip' recession of 2012 and so the investigation of any longer term 'lag' effects on health

was prevented. The established definition of recession used in this study – two consecutive quarters of negative economic growth - is also fairly arbitrary and other economic indicators such as unemployment rates, mortgage defaults or consumption falls may produce different results. However, the study also has the strength of examining data for two recessions not just one, and a good sample size drawn from respected national datasets so the results cannot be dismissed.

Conclusion

This paper has found that there are spatial variations in the health effects of recessions *within* countries and that the long-standing English health divide between North and South appears to reduce slightly during recessions for both men and women. However, the explanation for this finding is unclear and further research into the casual mechanism and longer term effects is desirable.

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Author Contribution Statement

CB initiated the study and CB and AC drafted the paper together with input from AK. CB is Principal Investigator and designed and oversaw all stages of the study. AC conducted the statistical analysis with input from AK and CB.

Box 1: English regions and sub-regions

The North

The North East has suffered from sustained economic decline as industries such as coal mining and ship building have virtually disappeared. It has the highest proportion of workless households and deprivation in England. The Northwest regional economy also went through a major period of restructuring and underperformance during the 1980s and 1990s and its economic activity rate is lower than every other English region except the North East. Yorkshire and the Humber also suffered from decline in its traditional industries in coal mining, steel, engineering and textiles in the 1980s and 1990s although it experienced above average growth during the long boom up to 2007.

The South

The South East is regarded as one of the most successful of England's regions, regularly achieving high growth rates, high economic activity rates and low unemployment. It is the 22nd largest economy in the world. The South East economy is advanced, high income, broadly based and service oriented. The South West is a relatively productive and wealthy region yet there are some persistent pockets of disadvantage. The region is characterised by a largely rural landscape. 81% of jobs are in the service sector.

The Midlands

In the East Midlands, manufacturing represents 23% of output and sectors that involve a high percentage of low skilled jobs are more dominant in the region. Whilst the economy has high employment and relatively high levels of economic growth, it performs less well than the English average on productivity. The West Midlands has undergone significant economic changes over the last three decades with the services sector replacing manufacturing as the principal source of employment. Income per head is lower than the English average. Up to 2007, the East of England had one of the highest long-term economic growth rates in the country and is the most research and development-intensive region.

London

London has the UK's highest productivity rate, and is the world's fourth largest economy. Employment is dominated by the financial, business and creative industries. 29% of residents are from minority ethnic groups and the region contains some areas with high levels of deprivation and worklessness (e.g. 35% of London children live in poverty - the highest proportion of any English region).

Adapted from (C Bamba and Popham, 2010).

Figure 1: Annual age adjusted prevalence rates (%) of 'not good health' for North and South England and quarterly percentage change in GDP, 1991-2010

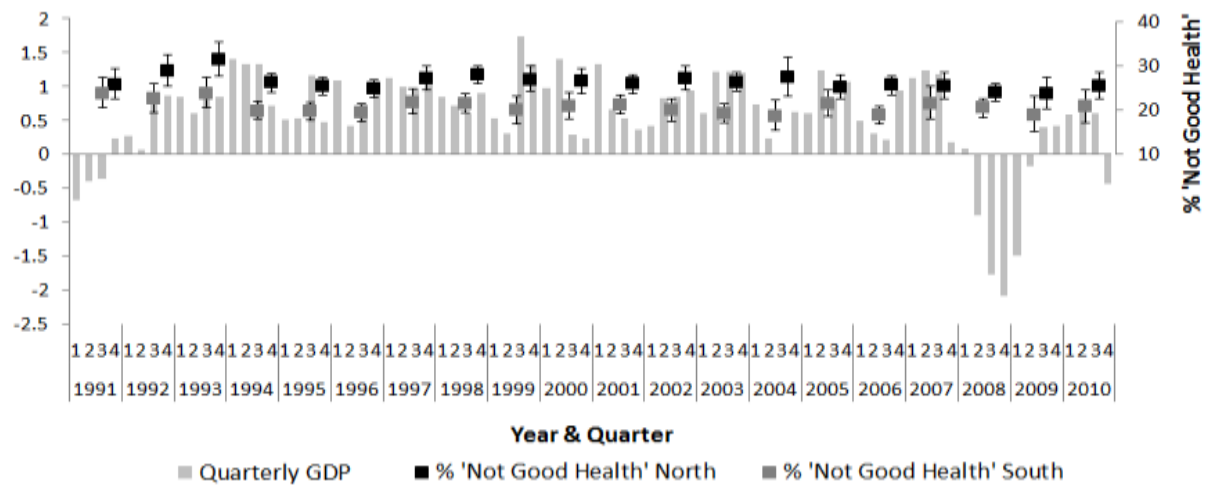


Table 1: Age-adjusted prevalence (%), rate difference and odds ratios (95% CI) for 'not good health' for each NHS Commissioning Region for the total study population and stratified by gender

NHS Regions	Prevalence 'not good health'			OR (95% CI)	OR compared to South	
	Non Recession	Recession	RD		Non-Recession	Recession
Total						
South of England	20.2	21.5	+1.2	1.06 (0.99, 1.13)	1	1
North of England	26.3	24.3	-2.0	0.91 (0.86, 0.96)*	1.50 (1.45, 1.55)*	1.29 (1.19, 1.39)*
Midlands & East	23.2	21.8	-1.4	0.92 (0.87, 0.98)*	1.23 (1.19, 1.27)*	1.07 (0.99, 1.17)
London	23.3	24.9	+1.6	1.07 (0.97, 1.19)	1.24 (1.18, 1.29)*	1.25 (1.12, 1.40)*
Men						
South of England	19.7	21.3	+1.7	1.10 (0.99, 1.20)	1	1
North of England	26.3	24.3	-2.0	0.89 (0.81, 0.97)*	1.55 (1.48, 1.63)*	1.25 (1.11, 1.41)*
Midlands & East	22.5	21.6	-0.9	0.96 (0.88, 1.04)	1.22 (1.17, 1.28)*	1.06 (0.94, 1.20)
London	22.6	23.3	+0.7	1.03 (0.89, 1.19)	1.26 (1.18, 1.34)*	1.17 (1.00, 1.38)*
Women						
South of England	20.8	21.5	+0.7	1.03 (0.94, 1.12)	1	1
North of England	26.2	24.2	-2.1	0.92 (0.85, 0.99)*	1.46 (1.41, 1.53)*	1.31 (1.18, 1.46)*
Midlands & East	23.8	22.0	-1.8	0.90 (0.83, 0.97)*	1.24 (1.19, 1.29)*	1.09 (0.97, 1.21)
London	24.0	26.1	+2.1	1.11 (0.97, 1.27)	1.23 (1.16, 1.30)*	1.32 (1.14, 1.53)*

* Significant at 95% level

Prevalence = age-adjusted prevalence of 'not good health'.

RD = age-adjusted rate difference (percentage points) between recession and non-recession.

OR = Odds ratio 'not good health' between recession and non-recession with 95% confidence intervals.

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